

Furthermore, preference is given to determining the priority code words in such a way as to achieve efficient operation. Preferably this means abandoning the assumption that the psychoacoustically significant code words, i.e. the priority code words, are those which code the spectral values with low frequency. This will often be the case, but does not always have to be so.

Normally priority code words are code words which code psychoacoustically important spectral lines, these usually being spectral values with high energy. It is equally important that spectral lines with high energy do not arise because of errors.

According to the present invention an indicator is used which is already implicitly determined. The indicator depends on the code table which is used. In the AAC standard there are e.g. eleven code tables with different absolute value ranges. The code table No. 1 comprises e.g. spectral values having an absolute value from -1 to +1, while the code table No. 11 can code spectral values from -8191 to +8191. The higher the code table is the greater is the value range which it permits. This means that code tables with low numbers represent only relatively small values, and thus permit only relatively small errors, while code tables with higher numbers can represent relatively large values and thus also relatively large errors.

If an error occurs in a low code table it may well not be audible since an erroneous spectral line results which, seen absolutely, does not differ that much from the originally correct spectral line. If an error occurs in the highest code table, however, this error can in principle assume any of the absolute values in this code table. If a spectral line coded with the highest code table had a small value, for example, and due to an error during transmission is decoded in the de-

coder as a spectral line with the highest absolute value of this code table, this erroneous spectral line will certainly be audible.

As far as error tolerance is concerned, the most important code table is therefore the highest code table (in the AAC standard the code table No. 11) since this code table permits escape values in the range from  $-2^{13} + 1$  (-8191) to  $+2^{13} - 1$  (+8191).

According to a further aspect of the present invention, short windows are used for transient signals in the AAC standard. With short windows the frequency resolution is decreased in favour of a higher temporal resolution. The priority code words are determined in such a way that psychoacoustically significant spectral values, i.e. spectral values at lower frequencies or spectral values from higher code tables, are sure to be placed on raster points. Scale factor band interleaving, a feature of e.g. the AAC standard, is revoked for this purpose.

Preferred embodiments of the present invention are explained in more detail below making reference to the enclosed drawings, in which

#### Brief Description of the Drawings

Fig. 1 shows an example of a rastering according to the second aspect of the present invention of a coded bit stream containing code words; and

Fig. 2 shows an arrangement of code words which increases linearly with the frequency according to the prior art.

### Detailed Description of the Preferred Embodiments

To illustrate the present invention, priority code words are shown hashed in Fig. 2, which represents a known arrangement of code words of different lengths which increases linearly with the frequency. In Fig. 2 priority code words are the code words No. 1 - No. 5. As has already been explained above, the code words which are assigned to spectral values of low frequency are priority code words if the audio signal e.g. contains a high speech content or relatively many low-frequency tones. The code words No. 6 - 10 in Fig. 2 are associated with higher frequency spectral values which, while contributing to the overall impression of the decoded signal, do not greatly affect the auditory sensation and are thus psychoacoustically less significant.

Fig. 1 shows a bit stream with a number of raster points 10 - 18, where the distance between the raster point 10 and the raster point 12 is labelled D1 and the distance between the raster point 14 and the raster point 16 is labelled D2.

As far as exposition of the first aspect of the present invention is concerned, only the part of the bit stream extending from the raster point 10 to the raster point 14 will be considered. The priority code words 1 and 2 are aligned in the raster to ensure that the important spectral portions, which are located in the lower frequency range in the example signal shown in Fig. 2, are not subject to error propagation when decoding. Non-priority code words, which are not hatched in Fig. 1 and 2, are arranged after the code words so as to fill up the raster. It is not necessary for the non-priority code